

Claims

1. A process of flocculating and dewatering an aqueous suspension of suspended solids comprising, introducing into the suspension,

(a) a concentrated/polymer solution and,

(b) a dilute/polymer solution,

characterised in that the concentrated and dilute polymer solutions are introduced into the substrate substantially simultaneously.

2. A process according to claim 1 in which the concentrated polymer solution and dilute polymer solution are introduced into the suspension as an aqueous composition comprising,

(a) a dilute aqueous solution of polymer and,

(b) a concentrated solution of polymer,

wherein the dilute solution and concentrated solution exist as substantially discrete components.

3. A process according to claim 2 in which the aqueous composition comprises,

(a) 25 to 99%, by weight of the dilute aqueous solution of polymer and,

(b) 1 to 75% by weight of the concentrated solution of polymer.

4. A process according to claim 2 in which the aqueous composition comprises,

(a) 40 to 99%, by weight of the dilute aqueous solution of polymer and,

(b) 1 to 60% by weight of the concentrated solution of polymer.

5. A process according to any of claims 1 to 4 in which the dilute aqueous solution has a concentration of polymer of below 0.3% by weight.

6. A process according to any one of claims 1 to 5 in which the dilute aqueous polymer solution comprises a cationic polymer, an anionic polymer or a nonionic polymer.

7. A process according to any of claims 1 to 6 in which the concentrated aqueous solution has a concentration of polymer of between 0.4 and 1.0%, by weight.

8. A process according to any one of claims 1 to 7 in which the concentrated aqueous solution comprises a cationic polymer, an anionic polymer or a nonionic polymer.

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9. A process according to any one of claims 1 to 8 in which the polymer dissolved in the concentrated solution is either co-ionic with the polymer dissolved in the dilute solution or non-ionic.

10. A process according to any one of claims 1 to 9 in which polymer dissolved in either the dilute solution or the concentrated solution is cationic and has been formed from a monomer or blend of monomers comprising at least one cationic monomer selected from the group consisting of quaternary ammonium and acid salts of dimethylaminoethyl (meth) acrylate, quaternary ammonium and acid salts of dimethylaminoethyl (meth) acrylamide and diallyldimethyl ammonium chloride.

11. A process according to any one of claims 1 to 10 in which the polymer(s) dissolved in either the dilute solution or the concentrated solution is anionic and has been formed from a monomer or blend of monomers comprising at least one anionic monomer selected from the group consisting of (meth) acrylic acid, 2-acrylamido-2-methylpropane sulphonic acid, alkali metal and ammonium salts thereof.

12. A process according to any one of claims 1 to 11 in which the polymer(s) dissolved in either the dilute solution or the concentrated solution is nonionic and has been formed from acrylamide or methacrylamide.

13. A process according to any one of claims 1 to 12 in which the cationic polymer dissolved in each of the dilute and concentrated aqueous solutions is a copolymer of acrylamide and at least one cationic monomer selected from the group consisting of quaternary ammonium and acid salts of dimethylaminoethyl (meth) acrylate, quaternary ammonium and acid salts of dimethylaminoethyl (meth) acrylamide and diallyldimethyl ammonium chloride, having an intrinsic viscosity of at least 4 dl/g.

14. A process according to any one of claims 2 to 13 in which the aqueous composition comprising the dilute aqueous solution of polymer and the concentrated solution of polymer is formed by introducing the concentrated solution of polymer into a flowing stream of the dilute aqueous solution of polymer.

15. A process according to claim 14 in which the dilute aqueous solution of polymer is formed by diluting a flowing stream of the concentrated aqueous solution of polymer with dilution water.

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A2 16. A process according to any one of claims 2 to 15 in which the aqueous composition is formed by,

- (a) passing a concentrated solution of polymer to a dilution where the solution is combined with dilution water to form a dilute solution,
- (b) passing the diluted solution through a mixing stage, selected from pumping and screening stages, and
- (c) introducing a concentrated solution of polymer into the dilute aqueous solution.

17. A process according to claim 16 in which the concentrated polymer solution, which is diluted to form the dilute polymer solution in step (a) is drawn from the same reservoir of concentrated polymer solution introduced into the dilute solution in step (c).

18. A process according to claim 16 in which the concentrated solution of polymer in step (a) is drawn from a different reservoir of concentrated polymer solution introduced into the dilute solution in step (c).

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A3 19. A process according to any one of claims 1 to 18 in which the dewatering process is selected from the group consisting of dewatering sewage sludge, dewatering a mineral suspension, dewatering a paper mill sludge, dewatering a deinked cellulosic sludge and a papermaking process.

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